

August Monthly Educational Module

“Frequently Asked Questions”

Day 1

We are back with our 8th Monthly Educational Module, and this month we are covering all of those Frequently Asked Questions you have about hydrology and the River Forecast Center! First, we are starting off with one of the most frequent questions we get. Check out the graphic below to find out what it is and its answer!

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Frequently Asked Questions

Where can I find historical river data for the Mississippi River?

- The US Army Corps of Engineers is the official record keepers for Mississippi River data. You can access their web site at www.usace.army.mil or www.rivergages.com.
- The LMRFC has a limited amount of unofficial Mississippi River data on our site here: <http://www.srh.noaa.gov/lmrfc/?n=lmrhc-mississippiandohioriverforecast>



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Day 2

Are you ready for another Frequently Asked Question with the LMRFC's Monthly Module?!? Well, you are in luck because we've got another good one for you! We are covering all those frequently asked questions about flood categories. Check out the graphic below to learn more!

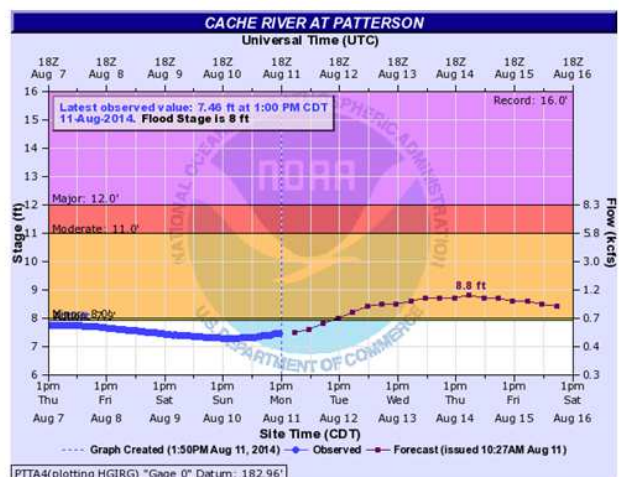
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Frequently Asked Questions

What are "action stage," "flood stage," and "record stage?" Are the river stages in the forecast seasonally related?

- Action stage is the stage at which some sort of action is taken for the river point. This is different for all points depending on the community's needs. It may be flooding of secondary roads or just a "heads up" that the river is rising.
- Flood stage is the stage at which structures begin to get affected. This may be a road or building. Flood stage is broken into 3 categories: minor, moderate, and major. Record stage is the highest stage that the river point has gotten to since records were established.
- None of our action or flood stages in the LMRFC area are seasonal, but there are some river points in the U.S. that are seasonal. For example, you may have a lower flood stage in the summer due to increased outdoor activities by the river.



Flood Categories (in feet)	
Major Flood Stage:	12
Moderate Flood Stage:	11
Flood Stage:	8
Action Stage:	7.9

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Day 3

Last month, we talked about where you can find all of the Mississippi River forecasts and data in the LMRFC's area; however, we are often asked where to find Upper Mississippi River forecasts and data. To find out the answer to this FAQ, check out the graphic below!

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Frequently Asked Questions

Where can I find river stages and forecasts for the Upper Mississippi River and the Ohio River?

- The Upper Mississippi River forecasts come from the North Central River Forecast Center (NCRFC) and can be found here: <http://www.crh.noaa.gov/ncrfc/>
- The Lower Mississippi River is also impacted by the Ohio River which is forecast by the Ohio River Forecast Center (OHRFC). You can access OHRFC's forecasts here: <http://www.weather.gov/ohrfc/>.
- You can also access river data from the NWS's River Watch site: <http://www.riverwatch.noaa.gov/>. This site has forecasts for the Mississippi, Ohio, Missouri, and Illinois Rivers.



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Day 4

Let's continue our FAQ Monthly Module with this interesting FAQ... "We hear about all the flooding along the northern Mississippi River. Why is it we don't see flooding impacts expected on the Lower Mississippi and Atchafalaya Rivers?" Check out the graphic below to find out the answer!

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Frequently Asked Questions

We hear about all the flooding along the northern Mississippi River. Why is it we don't see flooding impacts expected on the Lower Mississippi and Atchafalaya Rivers?

There are several reasons why we may not get a major rise on the Lower Mississippi and Atchafalaya Rivers from flooding along the northern Mississippi River. One reason is that water attenuates as it moves downstream, which allows for the flood wave to dampen as it travels further and further. In addition, reservoirs along the Mississippi River help to protect against major floods downstream.

It also depends on where and how much precipitation falls in the Upper Mississippi River and the Ohio River Valleys. If there is a significant amount of precipitation in both river basins, you will likely see flooding downstream; however, if you only get significant precipitation and flooding on the Upper Mississippi River or the Ohio River, you may not see flooding downstream. This is because the Lower Mississippi River has a larger channel capacity.



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Day 5

We've got another Frequently Asked Question for you and it's a good one! Last month, we talked about QPF; but we are often asked, "What is QPF?" Well, you are in luck! Check out the graphic below to find out!

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Frequently Asked Questions

What does QPF stand for?

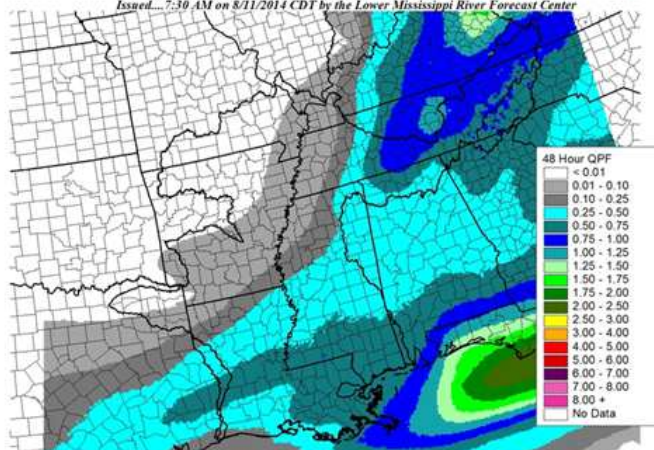
- QPF stands for Quantitative Precipitation Forecast which ultimately means an areal forecast of how much rainfall is expected over a period of time.
- The LMRFC QPF is broken into 6-hour time steps over a 10-day period. The QPF is issued 12Z (6AM/7AM), 18Z (12PM/1PM), 00Z (6PM/7PM), and during 24-hour operations at 06Z (12AM/1AM).



National Weather Service
LMRFC 48 Hour QPF



Valid...7 AM 8/11/2014 CDT thru 7 AM 8/13/2014 CDT
Issued...7:30 AM on 8/11/2014 CDT by the Lower Mississippi River Forecast Center



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Day 6

Next up, we are continuing our module with a FAQ on river stages! Check out the graphic below to learn more.

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Frequently Asked Questions

How are river stages calculated? Specifically, what is the point of reference used to determine a height?

River stage readings are measured in feet and are determined by the agency responsible for installing and maintaining the river gage. This is determined after coordinating with local agencies before the gage is installed. A river stage can either be manually read with a staff gage (pictured bottom right) or a wire weight gage (pictured top right). Or, the river gage can be automatic (pictured top left).

River stages are calculated from an arbitrary "gage zero" point, the point of reference used. The reason that we get negative levels is because these "gage zero" points were established decades ago and over time the river has shifted and scoured. The reason that this is not adjusted is because the people that live around the river are familiar with the flood stage and how the current stage compares to it. It takes a vast amount of planning and education in order to change a "gage zero" which would also change the flood stage.

Also, all "gage zero" points are independent of each other. For example, you may see a stage of -6.7 feet upstream of a 13.5 feet stage even though the river is higher at the upstream point when compared to mean sea level.



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Day 7

Have you ever wondered how the Lower Mississippi River Forecast Center forecasts its rivers? If so, you aren't the only one! This is one of the most common and frequently asked questions we get here at the LMRFC. So, we have answered it in the graphic below. Check it out!

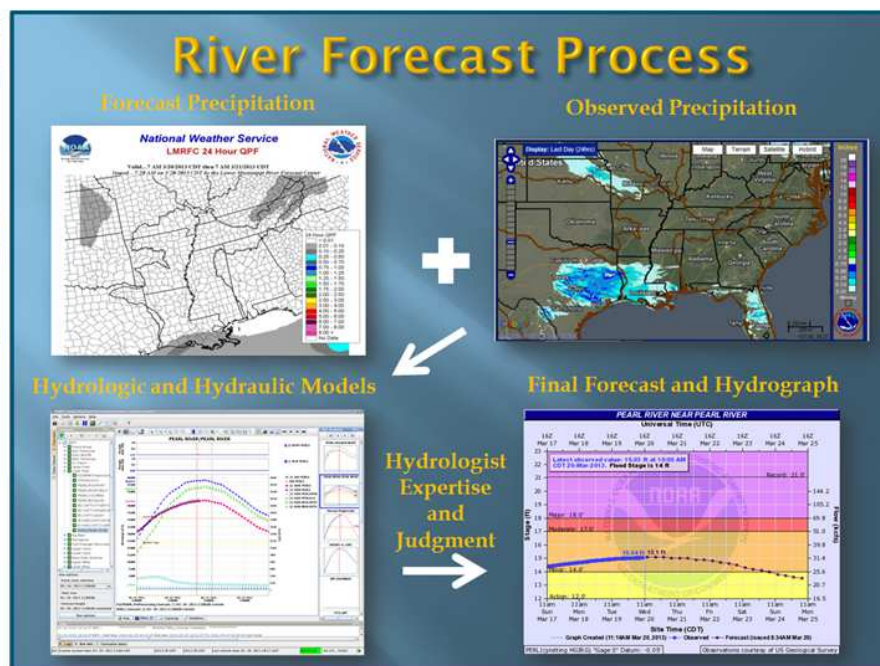
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Frequently Asked Questions

How do you forecast rivers?

LMRFC forecasters have to know how much precipitation is forecast over a certain time period. Most of the LMRFC forecasts use 12 hours of QPF, forecast precipitation; however, more forecast precipitation can be used during high impact events. LMRFC forecasters also have to know how much precipitation has fallen over the past 24 hours. Forecast and observed precipitation are key elements in determining how rivers are going to respond. Next, the LMRFC forecasters use a program called the Community Hydrologic Prediction System (CHPS) to view our hydrologic and hydraulic models. These models account for the forecast and observed precipitation, soil moisture conditions, and other routing elements for forecasting purposes. CHPS helps the forecaster to visualize observed river stages and hydrologic and hydraulic model output in order to issue a river forecast. The river forecast can either be viewed as a text file or as a hydrograph. These forecasts are then sent to the local Weather Forecast Offices to issue River Flood Warnings and Advisories, as well as displayed on the LMRFC webpage for the public to view.



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Day 8

Previously, we covered how our forecasters here at the Lower Mississippi River Forecast Center forecast rivers. We mentioned how observed precipitation is one of the key components in forecasting rivers. Now, we are discussing how the LMRFC determines this observed precipitation. Check out the graphic below to learn more!

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Frequently Asked Questions

How do you figure out how much precipitation has fallen over an area?

First, LMRFC forecasters look at radar estimates. However, radar estimates have limitations. Radar estimates can be contaminated by hail and false echoes, also referred to as anomalous propagation or clutter. This includes objects such as birds, planes, and even cars on bridges. Radar estimates can also be affected by beam blockage from mountains and other tall structures. In addition, there is an area near and above the radar, called the cone of silence, where the radar beam cannot scan. Lastly, radars can have mechanical problems.

So, this is why we use other resources to determine how much precipitation has fallen, such as rain gages. It is important to make sure you have rain gages in an area to verify precipitation data from the radar. Just like we need storm spotters for tornado, hail, and wind verification, we need rain gages for precipitation verification, especially in cases of flooding or flash flooding.

Lastly, LMRFC forecasters will use satellite data to verify where precipitation is falling or where it has fallen.



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Day 9

Are you ready for another Frequently Asked Question?! Great, we are too! Next up, we are covering a FAQ from our friends along the Pearl River. Check it out below!



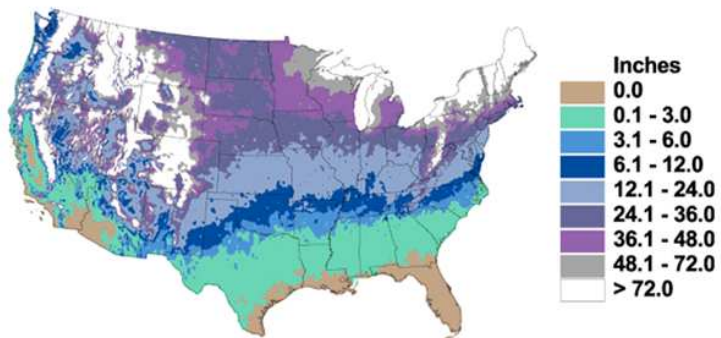
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Frequently Asked Questions

Is the Pearl River basin impacted by snowmelt along the Mississippi River?

No! Snowpack on the Mississippi River does not affect the Pearl River because these two river basins are not connected. However, the Pearl River basin can have snowmelt in the upper Pearl River basin, but the average total snowfall for the Pearl River basin is not enough to cause significant rises down the Pearl River. You can check the Annual Mean Total Snowfall amounts with the graphic pictured on the right.

Annual Mean Total Snowfall



National Oceanic and Atmospheric Administration

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Day 10

This would normally be our last post, but we have saved ONE extra FAQ for just you! Now, since we are coming into the peak of hurricane season, we thought it was fitting to cover a storm surge FAQ. Check out the graphic below to find out what it is!

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Frequently Asked Questions

How far inland can storm surge cause damage?

At the LMRFC, we have seen storm surge impacts on the Mississippi River all the way up to the Red River Landing gage (circled in red on the right). Red River Landing is just north of Baton Rouge, LA, and it is located at river mile 301.4. This means we have seen storm surge impacts over 300 miles inland! The image below is from our Facebook account when the storm surge made it all the way up the Mississippi River to Red River Landing, LA, during Hurricane Isaac in 2012 .



US National Weather Service Lower Mississippi River Forecast Center
August 29, 2012

Storm surge on lower Mississippi River between Donaldsonville and West Point a la Hache crested between 12-3AM at about 12.0-13.0ft NAVD88. The slow movement of Isaac and long duration of SE/ESE winds allowed the storm surge to equalize more than 150mi upriver from the mouth.

Locations upstream of Baton Rouge are nearing crest and the storm surge is now just upstream of Red River Landing, LA. <http://ow.ly/dj8D>



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Day 11

As promised, we have saved one more Frequently Asked Question for you, and it's a good one! Have you ever wondered if a river can flow upstream? What about if a river can flow north rather than south? Well, you are in luck because we have some answers for you! Check out the graphic below to see what they are!

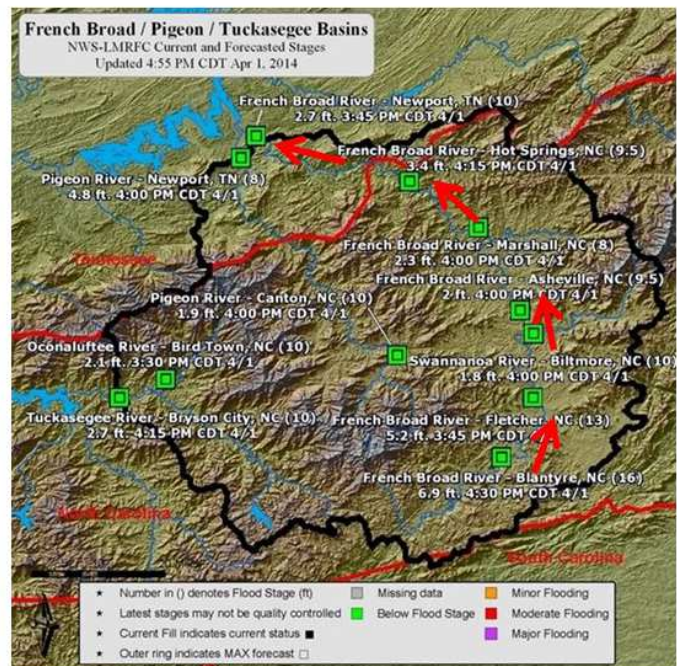
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Frequently Asked Questions

Can a river flow upstream? Can a river flow north?

Yes and yes! Most often a river flows downstream; however, you can backwater, storm surge, or earthquake effects that can cause a river to flow upstream. And, topography, especially in the mountains, is the main reason why a river can flow north. For example, the French Broad river basin, pictured to the right, flows north due to the topography in the area. You can follow the red arrows to see how this river basin flows.



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We hope you have enjoyed learning all about some of our frequently asked questions, and, hopefully, we answered some of your FAQ's as well!